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2012 Annual Report

Secretary Richard K. Sullivan

Massachusetts Executive Office of Energy & Environmental Affairs

April 2013

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SECRETARY

Letter from Energy & Environment Secretary Richard K. Sullivan

2012 was by far the hottest year on record in the continental United States. Although difficult to attribute any single weather event to global warming, a year of historic droughts, warm winters, and super storms like Hurricane Sandy have provided a snapshot of the challenges global warming presents to Massachusetts and our planet. Governor Patrick signed into law the Massachusetts Global Warming Solutions Act (GWSA) in 2008. This signature piece of legislation builds upon The Commonwealth's long history of leadership on environmental protection by mandating the most ambitious greenhouse gas (GHG) reductions for any single state in the nation. The GWSA required the Executive Office of Energy and Environmental Affairs (EEA), in consultation with other state agencies and the public, to set an economy-wide GHG emission reduction goal for Massachusetts that will achieve reductions of between 10 and 25 percent below statewide 1990 GHG emission levels in 2020, on the way toward at least 80 percent below statewide 1990 GHG emission levels in 2050.

EEA subsequently developed *The Massachusetts Clean Energy and Climate Plan for 2020* (The 2020 Plan) which we issued in late December 2010. In that plan, we established a GHG emission reduction mandate of 25 percent below 1990 levels in 2020, and a portfolio of policies related to buildings, electricity, transportation, non-energy emissions and in areas that cut across sectors. Implementing this broad package of policies will get us to The 2020 Plan's mandate of 25 percent reductions in 2020 and well on our way to meeting the 80 percent reduction in 2050.

EEA also released *The Massachusetts Climate Change Adaptation Report* in 2011, which laid out potential strategies to help prepare for and respond to the impacts of climate change. Our state agencies are working together to evaluate and implement these strategies. The historic damage Hurricane Sandy wrought on New York and New Jersey could have occurred here in Massachusetts had the storm taken a more northerly track, and Sandy serves as a stark reminder of the critical role our climate adaptation process will play in ensuring that our infrastructure, economy, and

communities are prepared for the rising sea levels, heavier rainfall, increased drought, stronger storms, and other negative and costly effects of climate change.

Massachusetts cannot solve a problem of global scope like climate change in isolation – we work very closely with a variety of regional and national stakeholders to bolster support for policies that will shift our economy away from fossil fuels. The Regional Greenhouse Gas Initiative (RGGI) is a perfect example of the regional collaboration where Massachusetts plays a leadership role. Governor Patrick joined RGGI in 2007 and RGGI remains a critical regional policy tool to reduce emissions from our electricity generation sector and support energy efficiency.

EEA has moved forward from developing The 2020 Plan to implementing it. We have done so by establishing a new GWSA Implementation Advisory Committee (IAC), some of whose members helped to draft The 2020 Plan. We held our IAC kick-off meeting in the spring of 2012, and I have tasked both Philip Griffiths, EEA Undersecretary for Environment, and Barbara Kates-Garnick, EEA Undersecretary for Energy, as well as Assistant Secretary for Energy, Steven Clarke, with leading the implementation process, working with their counterparts in other state agencies, to ensure success. The 2020 Plan and the Adaptation Report will help Massachusetts confront climate change, spur economic development and innovation, and save Massachusetts households and businesses money.

In order to achieve our goals, we recognize the importance of stakeholder engagement ranging from plan development through implementation. Thus, we are quite pleased to have the involvement of the Barr Foundation, a key, local supporter of climate change reduction, which has provided funds for a grant to support the creation of a state of the art performance management tool that we will use to quantify and monitor our progress with implementing The 2020 Plan. In addition, our IAC members have taken active roles, serving on subcommittees to advise staff from the various EEA and other agencies in the Commonwealth involved on this effort.

This is the first annual EEA GWSA report, and it will summarize the progress we have made in implementing The 2020 Plan during the past year. The level of engagement of stakeholders supportive of and impacted by The 2020 Plan suggests that with focus and an expectation of success, we can meet our implementation goals.

Richard K. Sullivan

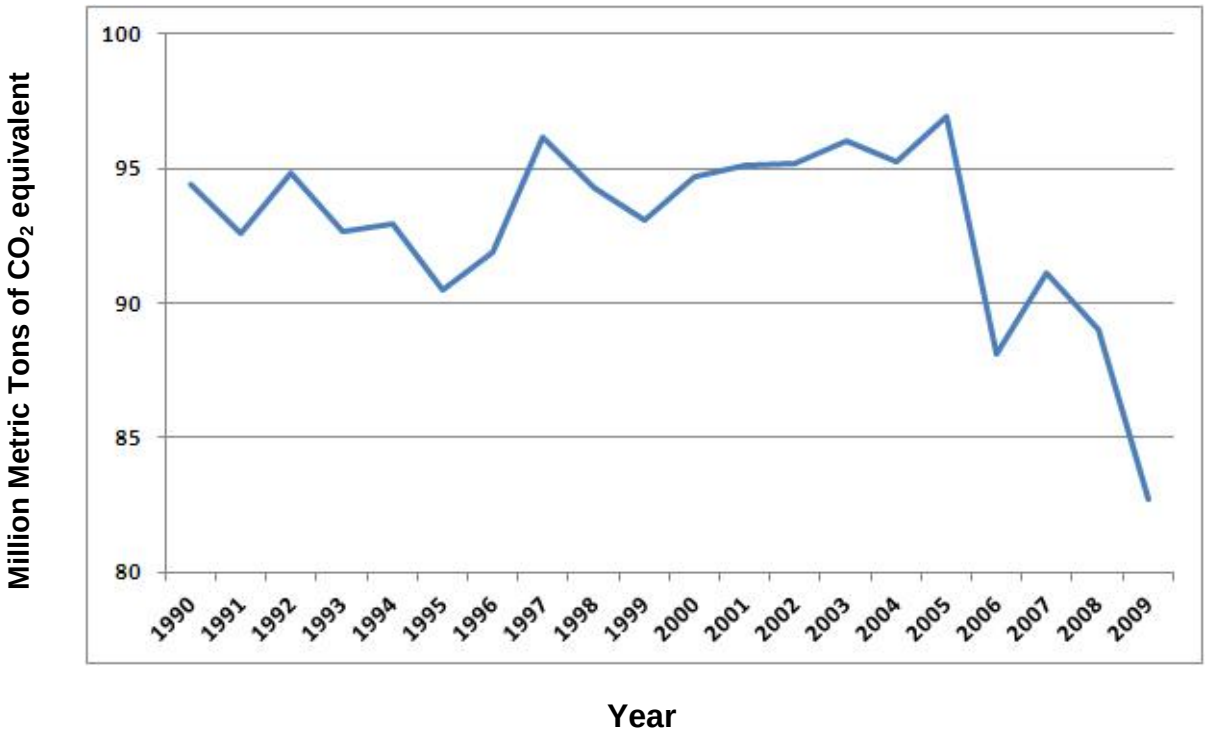
Secretary
Massachusetts Executive Office of Energy & Environmental Affairs

Massachusetts Greenhouse Gas Emissions Snapshot

Climate change is a shift in long term weather patterns: temperature, wind, precipitation, and more. There is a scientific consensus that our climate is changing as a result of global warming caused by human activities that produce greenhouse gas (GHG) emissions.

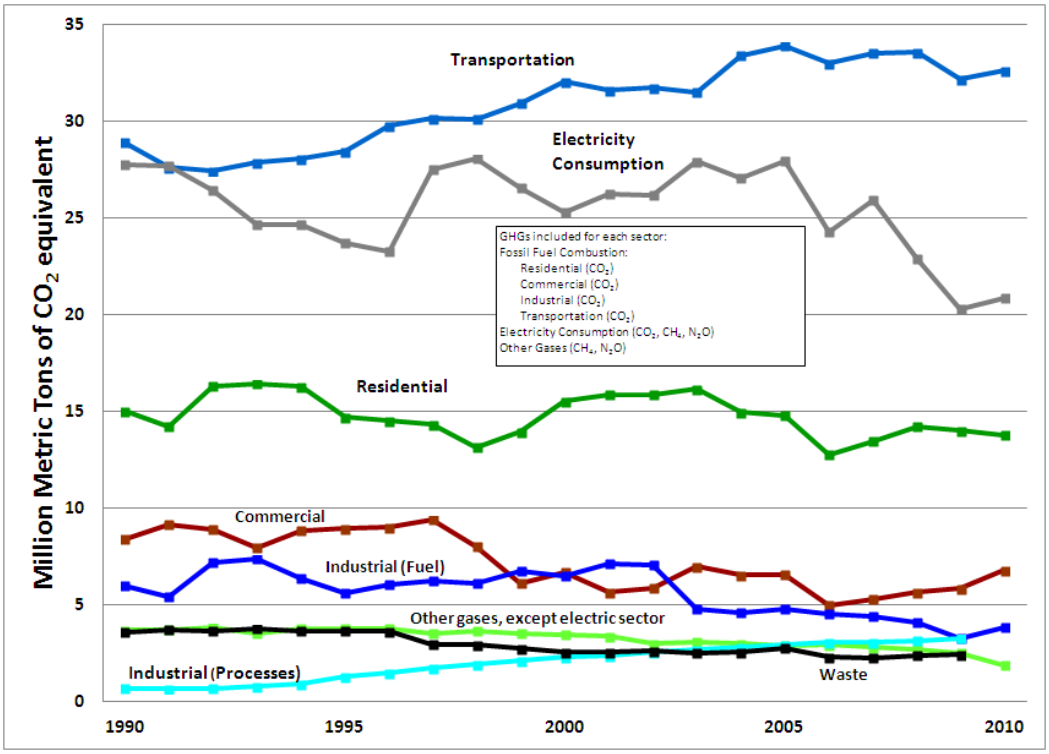
The Global Warming Solutions Act (GWSA) mandates that the Massachusetts Department of Environmental Protection (MassDEP) produce a GHG inventory every three years. The first GHG inventory covered the years of 2006, 2007, and 2008. Displayed below is a snapshot of Massachusetts GHG emissions, which illustrates a significant 11 percent drop in annual GHG emissions from our baseline year of 1990 to draft 2009 emissions (See Figure 1). Figure 2 shows a break-out of GHG emissions by sector.

Figure 1: Massachusetts Greenhouse Gas Emissions (Million Metric Tons of Carbon Dioxide Equivalents, $MMTCO_2e$)



Source: Massachusetts Greenhouse Gas Inventory
http://www.mass.gov/dep/air/climate/ghginv9012.xls

Figure 2: Massachusetts Greenhouse Gas Emissions by Sector (Million Metric Tons of Carbon Dioxide Equivalents, $MMTCO_2e$)



Year

Source Massachusetts Greenhouse Gas Inventory
http://www.mass.gov/dep/air/climate/ghginv9012.xls

While the observed reduction in total GHG emissions shown above is influenced by economic factors, including the recession, as well as weather patterns that affect the amount of energy used for heating and cooling, the overall goal of EEA's 2020 plan is to ensure that our policies ensure long-term GHG reductions through energy efficiency, sustainable transportation and land use planning, and other strategies.

CLEAN ENERGY AND CLIMATE PLAN: Strategies for Reducing GHG Emissions

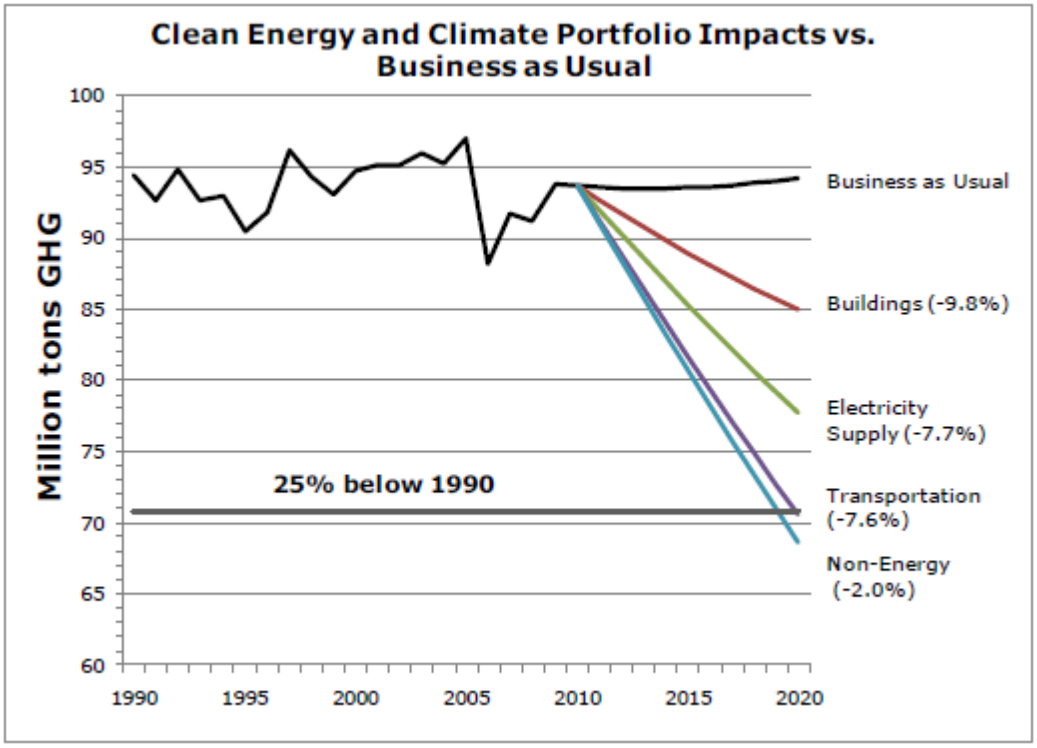
Table 1 below lists GHG reduction strategies for each sector and the corresponding emission reduction projected in the plan *(percent reduction based on comparison to 1990 levels)*

Table 1. Portfolio of Policies from the 2020 Plan

	STRATEGY	% Reduction By 2020
Buildings, Energy Efficiency and Demand-Side Management		**9.8%**
1	All Cost Effective Energy Efficiency (*now includes Deep Energy Efficiency Improvements*)	7.3 %
2	Advanced Building Energy Codes	1.6 %
3	Building Energy Rating and Labeling	**---**
4	Leading by Example (goal is 40% below 2002 levels)	Cross-Cutting
5	Green Communities	Cross-Cutting
6	Expanding Energy Efficiency Programs for C/I Heating Oil	0.1 %
7	Developing Renewable Thermal Energy market	0.1 %
8	Tree Retention & Planting to Reduce Heating and Cooling Loads	0.1 %
9	Federal Appliance and Product Standards	0.6 %
Electricity Generation and Distribution		**7.7%**
10	Expanded Renewable Energy and Alternative Energy Portfolio Standards	1.2 %
11	More Stringent Power Plant Rules	1.2 %
12	RGGI	**---**
13	Clean Energy Imports	5.4%
14	Off-Shore Wind	**---**
15	Clean Energy Performance Standard	**---**
Transportation, Smart Growth and Land Use		**7.6%**
16	Federal and California Vehicle Efficiency and GHG Standards (includes Reducing GHG Emissions from Motor Vehicle Air Conditioning)	2.9 %
17	Federal Emissions and Fuel Efficiency Standards for Medium and Heavy Duty Vehicles	0.3 %
18	Federal Renewable Fuel Standard and Regional Low Carbon Fuel Standard	1.6 %
19	Clean Car Consumer Incentives	0.5 %
20	Pay as You Drive (PAYD) auto Insurance (pilot program, possible expansion later)	0.4-2.1 %
21	GreenDOT	1.2 %
22	Smart Growth Policy Package (also includes “sustainable development principles”	0.5 %
Non energy Emissions		**2.0%**
23	Stationary Equipment Refrigerant Management	1.3 %
24	Reducing SF6 Emissions from Gas-Insulated Switchgear	0.2 %
25	Reducing GHG Emissions from Plastics	0.3 %
Other Cross-Cutting Policies		**---**
26	MEPA GHG Policy and Protocol	---
27	Consideration of GHG Emissions in State Permitting, Licensing, and Administrative Approvals	---
TOTAL		**27%**

As outlined below in Figure 3, the 2020 Plan compared a Business as Usual (BAU) trend in GHG emissions with projected reductions from implementation of strategies in the Buildings, Energy, Transportation and Non-energy sectors, indicating a **potential** 27 percent emission reduction compared to 1990 levels.

Figure 3: Clean Energy and Climate Plan for 2020: Anticipated Impact of Commonwealth's Strategies versus Business as Usual (million metric tons of carbon dioxide equivalents, MMTCO2e).



Emissions reductions by sector for the portfolio of policies, at the mid-range estimate of 27 percent below 1990 levels by 2020. Source: Massachusetts Clean Energy and Climate Plan for 2020 http://www.mass.gov/eea/docs/eea/energy/2020-clean-energy-plan-summary.pdf

The GHG emissions inventory will continue to be an important source of data going forward. Comparison of annual emissions, in total and by sector, against the 1990 baseline emissions data as shown in Table 1 will help determine whether the Commonwealth is succeeding in terms of GHG emission reductions to meet the GWSA goals. As noted above, 2009 data indicated an 11 percent reduction in emissions as a result of various factors. While the Commonwealth's emphasis upon energy efficiency and developing renewable sources of energy is laying the groundwork for continued

reductions in GHG, it is not possible at this point in time to provide an accurate estimate of the percent reductions that can be credited to specific policies. However, it is critical that EEA will be able to make such determinations in the future. Thus, EEA and the GWSA Team are developing critical planning metrics to evaluate the performance of each policy and strategy outlined in the 2020 Plan

EEA GWSA IMPLEMENTATION & 2020 PLAN UPDATE

During 2012, EEA Secretary Richard Sullivan put in place the organizational framework for implementation of the GWSA. Secretary Sullivan appointed an Implementation Advisory Committee (IAC), a process for inter-agency and inter-secretariat collaboration, and a mechanism for stakeholder participation.

In appointing and convening members for the IAC, the Secretary sought to include a broad base of interests for advising on energy and environmental issues. The IAC includes representatives from business and industry, academia, environmental advocacy groups, and other stakeholders.

The IAC replaces its predecessor, The Climate Protection & Green Economy Advisory Committee (CPGEAC), which was focused on the development of the 2020 Plan, and met for the last time in January of 2012. EEA also had convened a Climate Change Adaptation Advisory Committee that studied and made recommendations for adapting to climate change. EEA established both of these committees in accordance with Sections 8 and 9 of the Climate Protection and Green Economy Act.

Phil Griffiths, EEA Undersecretary for Environment, and Barbara Kates-Garnick, EEA Undersecretary for Energy, co-chair the IAC. The IAC met twice in 2012—in June and September. IAC meetings are open to the public and publicized in advance on the EEA GWSA website. Since its June 2012 kickoff meeting, the IAC has focused on assessing the current status of the 2020 Plan's strategies, developing supplemental GHG emission reduction strategies, and further developing the climate change adaptation process.

<u>IAC Members</u>

Co-Chair: Phil Griffiths, Undersecretary for Environment, EEA

Co-Chair: Barbara Kates-Garnick, Undersecretary for Energy, EEA

Susan K. Avery, PhD., President & Director, Woods Hole Oceanographic Institution

George Bachrach, President, Environmental League of Massachusetts

Cynthia Barnhart, Associate Dean, Ford Professor of Engineering, MIT

Nolan Browne, Managing Director, Fraunhofer CSE

Geoff Chapin, CEO, Next Step Living

Richard A. Dimino, President & CEO, A Better City

Marc Draisen, Executive Director, Metropolitan Area Planning Council

Brian Fairbank, President & CEO, Jiminy Peak Mountain Resort LLC

Berl Hartman, New England Chapter Director, Environmental Entrepreneurs (E2)

Russell E. Hill, President, R.E. Hill & Company

Brian Swett, Chief, Environmental & Energy Services, City of Boston

Henry Tepper, President, Mass Audubon

Wayne A. Klockner, Vice President/State Director, The Nature Conservancy

Penn Loh, Professor of the Practice, Urban & Environmental Policy & Planning, Tufts University

Jeremy C. McDiarmid, Massachusetts Director, Environment Northeast

Marcy Reed, President, National Grid

Sue Reid, Vice President and Director, Conservation Law Foundation (CLF) – Massachusetts

Peter Rothstein, President, New England Clean Energy Council

Organization: EEA GWSA Implementation - the Team, Approach and Activities

EEA's GWSA Implementation Team works with the support of the EEA Commissioners who designated their staff to serve as Chairs of the five GWSA Subcommittees and to spearhead specific clean energy and climate strategies. The Implementation Team ensures a high level of coordination among the EEA agencies, the Executive Office of Housing and Economic Development (EOHED), Massachusetts Department of Transportation (MassDOT) and the Massachusetts Clean Energy Center (CEC), and also manages the IAC process and work of the Implementation Subcommittees.

EEA GWSA Implementation Team

Phil Griffiths, Undersecretary for Environment

Barbara Kates-Garnick, Undersecretary for Energy

Steven Clarke, Assistant Secretary for Energy

Aisling O'Shea, Global Warming Solutions Manager

Lauren Farrell, Operations & GWSA Policy Assistant

Hong-Hanh Chu, Emissions Data Analyst

EEA Commissioners

Ken Kimmell, Massachusetts Department of Environmental Protection (MassDEP)

Mark Sylvia, Massachusetts Department of Energy Resources (DOER)

Ann Berwick, Chair, Massachusetts Department of Public Utilities (DPU)

David Cash, Massachusetts Department of Public Utilities (DPU)

Jolette Westbrook, Massachusetts Department of Public Utilities (DPU)

Greg Watson, Massachusetts Department of Agricultural Resources (DAR)

Ed Lambert, Massachusetts Department of Conservation & Recreation (DCR)

Mary Griffin, Massachusetts Department of Fish & Game (DFG)

Massachusetts Clean Energy Center (CEC)

Alicia Barton, Executive Director and Chief Executive Officer

<u>Implementation Subcommittees</u>

In April of 2012, the EEA Team began to monitor progress towards implementing the Commonwealth's GHG reduction goals. The Subcommittee directors represent Massachusetts' top policy experts in a broad range of climate issues ranging from land use and conservation, water, air emissions, energy, and transportation. Four of the Subcommittees analyze the four primary GHG emission sectors identified in the 2020

Plan, while the fifth Implementation Subcommittee focuses on issues related to climate adaptation. In 2012, the Implementation Subcommittees conducted a thorough review of each strategy within the 2020 Plan in order to ascertain *the status, development and progress* of each strategy. The Implementation Subcommittees also identified supplemental strategies that were not included in the 2020 Plan and that could provide emission reductions beyond the 2020 Plan strategies.

1. Buildings, Energy Efficiency, & Demand Side Management
    a. Team Leader
        i. **Christina Halfpenny, Director, Energy Efficiency, DOER**

    b. Team Profile
        i. The Massachusetts building sector is responsible for more emissions than any other sector in the state. Buildings consume more than 46 percent of the energy used in Massachusetts and constitute 41percent of the state's GHG emissions, including over 24 percent from direct fuel use excluding electricity. In order to achieve the carbon reduction goals established under the GWSA, The 2020 Plan established a range of programs targeted to address emissions associated with the amount and location of existing and new building space, the energy performance of these buildings, and the choice of energy sources. This subcommittee is implementing the following key programs to meet its emissions reductions targets : All Cost-Effective Energy Efficiency, Advanced Building Energy Codes, Building Energy Rating and Labeling, Deep Energy Efficiency Improvements for Buildings, Expanding Energy Efficiency Programs to Commercial/ Industrial Heating Oil, Developing a Mature Market for Solar Thermal Water and Space Heating, Tree Retention and Planting to Reduce Heating and Cooling Loads, and Federal Appliance and Product Standards.

2. Energy Generation & Distribution
    a. Team Leader
        i. **Bram Claeys, Director Renewable Energy Policy, DOER**
    b. Team Profile
        i. This subcommittee will implement policies geared towards the reduction of carbon emissions from the state's energy generation and distribution sectors. A multi-faceted approach will achieve the emissions reductions targets established in The 2020 Plan and will support the development of renewable energy generation through the state's Renewable Energy Portfolio Standard (RPS), pricing carbon through RGGI, and importing low-carbon electricity from

Canada, all while older coal plants retire due in part to new EPA air quality regulations.

3. Transportation, Smart Growth, and Land Use
    a. Team Leaders
        i. Kurt Gaertner, Planning Coordinator, EEA
        ii. **Catherine Cagle, Director of Sustainable Transportation, MassDOT**
    b. Team Profile
        i. Transportation is second only to buildings with regards to GHG emissions in Massachusetts. The 2020 Plan takes into account state and federal measures to improve vehicle efficiency, reduce vehicle miles traveled (VMT), increase use of lower-carbon fuels, and propose additional measures that will contribute toward meeting the 2020 limit. The Transportation Subcommittee is responsible for prioritizing and facilitating implementation of these programs and will focus on ways to improve vehicle efficiency, moderate the growth in auto travel through providing alternatives, and promote the development and use of vehicle fuels that yield lower GHG emissions than petroleum-based fuels. Policies cited in the plan include: Federal and California Light Vehicle Efficiency and GHG Standards, Federal GHG Emissions and Fuel Efficiency Standards for Medium- and Heavy-Duty Vehicles, Clean Car Consumer Incentives, Pay As You Drive (PAYD) Auto Insurance Pilot, Massachusetts Sustainable Development Principles, GreenDOT and the Smart Growth Policy Package.

4. Non-Energy Emissions
    a. Team Leader
        i. **Sharon Weber, Senior Technical Advisor, MassDEP**
    b. Team Profile
        i. GHG emissions from activities not related to energy use represent a small but important part of statewide GHG emissions. Although these sources represent on the order of 7 percent of total emissions, many of the gases emitted by these processes have a high global warming potential (GWP), thousands of times greater than CO_2. Furthermore, projections of future emissions show steady growth in certain industrial emissions while emissions from most energy related sectors, with the exception of transportation, are projected to level off or even decline. Specific industrial processes that emit significant quantities of GHGs in Massachusetts include: leakage of refrigerant chemicals from commercial equipment and motor vehicle air conditioners, leakage of Sulfur Hexafluoride (SF_6) from electric power transmission and distribution, and combustion of plastics in solid waste incinerators.

This subcommittee will work to reduce emissions from non-energy sources through some of the following policies: Reducing GHG Emissions from Motor Vehicle Air Conditioning, Stationary Equipment Refrigerant Management, Reducing SF_6 Emissions from Gas-Insulated Switchgear, and Reducing GHG Emissions from Plastics.

5. Climate Change Adaptation
    a. Team Leader
        i. **Kathy Baskin, Director of Water Policy, EEA**
    b. Team Profile
        i. The GWSA directs the EEA Secretary to convene an advisory committee which developed a report that analyzed strategies for adapting to predicted climate change. This Committee released The Massachusetts Climate Change Adaptation Report in 2011 which includes an overview of observed and predicted changes to the Massachusetts climate, predicted climate change vulnerabilities, and potential adaptation strategies that could help increase resilience and preparedness among several sectors, including natural resources and habitat, key infrastructure, public health and welfare, local economy and government, and the coastal zone and ocean. The Adaptation Subcommittee, with broad state agency representation, is responsible for prioritizing and facilitating implementation of adaptation strategies.

The Implementation Subcommittee Team Leaders have met with members of the IAC and other key stakeholders in order to provide updates and solicit feedback on measures. During the IAC Meeting on September 19, 2012, the Subcommittee team leaders presented the IAC with a summary of the 2020 Plan strategy progress reports. It includes highlights from subcommittee evaluation of progress on implementing the 2020 Plan and discussion topics for IAC input. We have provided that summary as an Appendix.

As a follow up to that meeting and in preparation for the next IAC in January 2013, the subcommittees focused efforts on a) identifying and prioritizing supplemental strategies to enhance the 2020 Plan, and b) developing recommendations for a collaborative process to advance climate adaptation in Massachusetts and for priority strategies and projects to ensure preparedness during extreme weather events.

EEA Clean Energy and Climate Plan Performance Management System

The Barr Foundation awarded EEA with a $230,000 grant in September of 2012 to develop a Clean Energy and Climate Plan Performance Management System (CCPMS). The CCPMS will monitor and evaluate the success of the Commonwealth's greenhouse gas (GHG) emissions reduction strategies, and communicate this information to the public. When completed, the system is expected to serve as a regional and national model that other states can adopt to analyze their efforts to reduce GHG emissions.

EEA is currently developing the CCPMS and plans on it being operational in late 2013. EEA issued a Request For Information (RFI) in November in order to solicit preliminary feedback from potential vendors on the design and cost of the CCPMS. EEA plans on issuing a Request for Quotes for development of the CCPMS in early April of 2013.

An effective performance management system requires high quality data and meaningful metrics. The EEA GWSA Team is in an intensive stage of developing metrics to evaluate strategies for GHG emission reductions and is working with stakeholders to design a "Dashboard" to communicate progress via the GWSA website. The ongoing data analyses, metrics development, and performance management system design will enhance capacity for policy evaluation and reporting going forward.

EEA plans on launching a preliminary Dashboard with policy-related metrics in May of 2013. The CCPMS is scheduled for completion in October 2013. EEA will also release a summary report with an update on progress in the fourth quarter of 2013.

Appendix

The Massachusetts Executive Office of Energy & Environmental Affairs (EEA)

Global Warming Solutions Act (GWSA)

Implementation Subcommittees

www.mass.gov/eea/gwsa

Clean Energy & Climate Plan for 2020: Summary Reports

As Presented to the EEA

Implementation Advisory Committee (IAC) Meeting

September 19, 2012

Buildings, Energy Efficiency, and Demand-Side Management

Subcommittee Highlights

Strategy Implementation - Progress Rating

Low:	Expand Energy Efficiency to Oil in Commercial and Industrial buildings (0.1 %)[1]
Medium:	All cost-effective energy efficiency/ 3-year plans (7.1 %) Advanced building codes (1.6 %) Green Communities (cross-cutting) Leading by Example (cross-cutting)
High:	Building rating & labeling (supports other strategies) Solar thermal (0.1 %) Federal appliance standards (0.1 %) Tree planting (0.1 %)

Key Findings & Recommendations

- The 3-year plans for utility funded energy efficiency is by far the biggest element of the 2020 plan from the buildings sector. While these plans are moving forward, their current projected savings are less than anticipated in the 2020 plan. This is partly, but not completely explained by the drop in natural gas prices and the economic downturn – which help reduce the Massachusetts green house gas (GHG) footprint in other ways. Opportunities to engage in the 3-year planning process remain, but a finalized plan must be submitted to the Department of Public Utilities (DPU) by October 31 2012.

- The 2nd major source of savings is Advanced Building Codes – this is also not expected to meet the emissions targets in the plan for two reasons: a) the downturn in the construction market and b) the delay in rolling out new energy codes.

- Other initiatives that support these main two strategies, such as deep energy retrofits, building rating and labeling and federal appliance standards, are moving forward with minor delays.

[1] Reflects the percent reduction in GHG emissions (compared to 1990 levels) that is projected for each strategy in the *Clean Energy and Climate Plan for 2020*

- The Solar thermal market is developing well and the research on the benefits of urban tree canopy is encouraging. In light of the shortfall in GHG reductions from the two primary policies, the sub-committee welcomes input on additional, supplementary strategies for the buildings sector.

Discussion Topics

There are a number of potential discussion topics within this sector:

1. How close can we get to the GHG targets for all cost-effective energy efficiency in the 2013-15 Program Administrator (PA) energy efficiency plans, and in future planning out to 2020?

2. The PA energy efficiency plans provide potential funding and statewide scale, but require extensive evaluation for cost-effectiveness and add significant overhead costs. To what extent should 2020 strategies such as deep energy retrofits, rating and labeling, advanced codes and federal standards fall under the PA energy efficiency plans, versus being separately funded initiatives?

3. What other strategies should be deployed to enhance the likelihood of meeting state GHG goals?

4. What strategies could create long-term GHG savings and benefit legacy oil heating users?

Energy Generation and Distribution

Subcommittee Highlights

Strategy Implementation - Progress Rating

Low: Clean Energy Performance Standard (-); Clean Energy Imports (5.4%)[2]

Medium: RPS/APS (1.2%); RGGI; Offshore Wind

High: EPA Power Plant Rules (1.2%)

Key Findings & Recommendations

The Clean Energy and Climate Plan includes 6 strategies grouped in the Energy Generation and Distribution subcommittee, that together are estimated to contribute a reduction of 7.7 percent in greenhouse gas emissions by 2020. The retiring of two coal plants in the state is going forward as expected. The Renewable Energy Portfolio Standard (RPS) is also on track, and the development of solar photovoltaic (PV) is increasing significantly. The Alternative Portfolio Standard (APS) is slower than expected. The largest contribution to emission reductions is expected from the import of large scale hydroelectric power from Canada. This is the most challenging part of this group of strategies. An analysis of the risks and opportunities of a Clean Energy Performance Standard will be performed by summer 2013.

Discussion Topics

- Offshore wind energy holds great potential for Massachusetts. The biggest challenge of realizing this potential is **financing** the projects. Does the IAC have recommendations for new sources of financing of offshore wind?
- The IAC might want to look into new **additional strategies**, to be prepared in case the current strategies deliver less than proposed. Does the IAC have recommendations for additional strategies?

[2] Reflects the percent reduction in GHG emissions (compared to 1990 levels) that is projected for each strategy in the *Clean Energy and Climate Plan for 2020*

Transportation, Smart Growth and Land Use

Subcommittee Highlights

Strategy Implementation - Progress Rating

Low: Clean Car Consumer Incentives (0.5%)[3]

Medium: Federal Renewable Fuel Standard & Regional Low Carbon Fuel Standard (1.6%)
Smart Growth Policy Package (Sustainable Development Principles) (0.5%)

High: Federal & California Vehicle Efficiency & Greenhouse Gas Standards (2.6%)
Federal Emissions & Fuel Efficiency Standards for Medium
& Heavy Duty Vehicles (0.3%);
GreenDOT (1.2%); Pay as You Drive (PAYD) Auto Insurance (pilot program) (1.1%)

Key Findings & Recommendations

- Policies reliant on Federal Standards & Massachusetts adoption of California standards are on track to produce expected GHG reductions.
- The Regional Low Carbon Fuel Standard (LCFS) is progressing, but more slowly than anticipated. States monitoring outcome of CA lawsuit.
- The Pay As You Drive (PAYD) Pilot will begin soon; expected GHG reductions from pilot may need refinement.
- A response to public comments will result in a final GreenDOT Implementation Plan this fall; the next step is Division work plans based this Plan.
- Clean Car Consumer Incentives described in the Clean Energy & Climate Plan appear unfeasible; Clean Cities Program initiatives are proposed as an alternative.
- Progress on "Smart Growth Policy Package" is mixed & implementation will be a focus this fall including drafting of "Workforce Housing Policy" & "EOHED Regional Initiatives" work plans.

Discussion Topics

- Endorsement of Clean Cities GHG reduction measures to address Clean Car Incentives shortfall.
- Importance of adequate transportation funding to realize GreenDOT & Smart Growth goals.
- Broader incorporation of forest conservation into GWSA implementation strategies
- Coordination of 1) smart growth policies being pursued by the Adaptation, Buildings, & Transportation Subcommittees and 2) land use policies being pursued for discreet purposes [like VMT and GHG reduction pursuant to the GWSA & CECP] as part of a Patrick-Murray Administration approach to land conservation & development.
- The IAC might want to look into new strategies to be prepared in case present strategies deliver less than proposed. Does the IAC have recommendations for additional strategies?

[3] Reflects the percent reduction in GHG emissions (compared to 1990 levels) that is projected for each strategy in the *Clean Energy and Climate Plan for 2020*

Non-Energy Emissions

Subcommittee Highlights

Strategy Implementation - Progress Rating

High:	Reducing Sulfur Hexafluoride (SF_6) Emissions from Gas-Insulated Switchgear (0.2%)[4];
	Reducing Emissions from Plastics Combustion (0.3%);
	Stationary Equipment Refrigerant Management (1.3%)

Key Findings & Recommendations

The Clean Energy and Climate Plan includes 4 strategies grouped in the Non-Energy Emissions subcommittee that together are estimated to contribute 2 percent of greenhouse gas emission reductions by 2020. Because motor vehicle air conditioning emission reductions are addressed in MassDEP's Low Emission Vehicle regulations, that strategy is reported on in the Transportation subcommittee. SF_6 emission reduction is going forward through a MassDEP regulation expected to go to public comment by the end of the year. Plastics Combustion reduction is occurring through a suite of activities under MassDEP's Solid Waste Advisory Committee, and is on track. Refrigerant Management is being explored through meetings with technically-knowledgeable or potentially-affected stakeholders, intended to lead to proposed regulations in the second half of 2013.

Discussion Topics

- Refrigerant Management holds the biggest challenge, in identifying smaller potentially-affected facilities. Does the IAC have recommendations for outreach to this sector?
- The IAC might want to look into new **additional strategies**, so as to be prepared in case present strategies deliver less than proposed. Does the IAC have recommendations for additional strategies?

[4] Reflects the percent reduction in GHG emissions (compared to 1990 levels) that is projected for each strategy in the *Clean Energy and Climate Plan for 2020*

Climate Change Adaptation

Subcommittee Highlights

Strategy Implementation - Progress Rating

High: Work Plan projects are just getting started.

Key Findings & Recommendations

The first Massachusetts Climate Change Adaptation Report, released in 2011, outlines over 200 potential strategies in sectors such as Natural Resources/Habitat, Public Health, Infrastructure (energy, water, wastewater, solid waste, transportation), Economy (manufacturing, services, agriculture, forestry, fisheries, healthcare, education), Local Government, and Coastal Zone and Ocean. State agencies have been involved in climate change adaptation activities such as evaluating existing capabilities, resources, and programs; securing funding for surveys, outreach, and inventory assessments; and assessing vulnerabilities of their resources. At a recent meeting between EEA agencies, MassDOT, DPH and stakeholders about ongoing adaptation activities, participants identified the need for more information sharing and collaboration.

EEA, through its Work Plan, will focus on projects with multi-sectoral and -agency relevance:

- Explore mechanisms for addressing the potential impacts of climate change (such as sea level rise) as part of EEA's Massachusetts Environmental Policy Act (MEPA) and required by GWSA; evaluate approach and methodology for assessing land alteration impacts and mitigation in the context of MEPA's GHG policy
- Review latest science and develop updated climate change projections for Massachusetts
- Develop tools that allow visualization of predicted climate change on landscape and infrastructure
- Host workshops to transfer information about latest tools and data

Discussion Topics

- Interested in IAC feedback and comments on the above projects.
- Would the IAC like to discuss specific adaptation topics at future meetings?